**Commonwealth of Kentucky**
**Division for Air Quality**

# *PERMIT STATEMENT OF BASIS*

DRAFT
Conditional Major/Synthetic Minor Operating
Permit: F-07-048
Huntington Alloys Corporation
Burnaugh, KY 41129
February 20, 2008
Zari Hariri, Reviewer

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| SOURCE ID: | 21-019-00013 |
| AGENCY INTEREST: | 329 |
| ACTIVITY: | APE20060001 |

**SOURCE DESCRIPTION:**

Huntington Alloys Corporation (Huntington Alloys) owns and operates a nickel alloys manufacturing facility, located in Burnaugh, Kentucky. Huntington Alloys manufacturers nickel and high-nickel alloys in various shapes, ingots, billets and tubing. Manufacturing processes at the site include melting of metals to produce alloy ingots; extruding and tube-reducing to form tubing products; heat-treating to aid processing and improve physical characteristics of the formed product. Manufacturing portions of the facility consist of three main buildings, these are: a raw materials building (Building 02, Department 40) where raw materials are melted down in an air induction furnace and shaped into molds; an extrusion building (Building 03, Department 50) where rods are processed into tubes; and the special projects building (Building 01, Department 30) where metal powders are blended and processed through an atritter to form semi-finished products. The Standard Industrial Classification (SIC) Code for this source is 3356, *Rolling, Drawing, and Extruding of Nonferrous Metals, Except Copper and Aluminum*.

Huntington Alloys is currently operating under permits C-83-99, issued on July 1, 1983, C-86-032, issued on January 21, 1986, C92-016, issued on January 16, 1992, and S-95-254, issued on December 4, 1995. A request for renewal of S-95-254 as a source-wide operating permit was received by the Division on June 5, 2005, and a subsequent request to construct a new electroslag remelting furnace on July 3, 2006. The permittee has requested the continuance of previously established voluntary limits on production such that the potential to emit (as defined in 401 KAR 52:001, Section 1 (56)) of particulate matter (PM/PM10), any single hazardous air pollutant (HAP) and the combination of HAPs remains less than established major source thresholds. This operating approval is the initial Conditional Major Permit issued to this source pursuant to the provisions of 401 KAR 52:030, *Federally Enforceable Permits for Nonmajor Sources*. Due to the removal of previously approved equipment, i.e., EP 02(02) - electroflux remelt furnace; EP 04(18) - boiler, Dept. 30; EP 06(20) - boiler, Dept. 40; EP 16(15,16) - grinding; EP 20(04) - induction furnace; and EP 21(03) - shell mold oven; the installation of new EP 27 (electroflux remelt furnace) which commenced operation on February 26, 2007; and the continued use of particulate emissions control equipment, the prior voluntary limits on material usage and production are revised such that the source shall be in compliance with the prescribed emission limits provided in Section D of the permit.

The source consists of the following significant emission units:

(a) EP 15 - Gas Boiler for Pickling

Description: Gas Boiler for Pickling Operation – Cleaver Brooks
Fuel: Natural gas
Construction Date: 1970
Rated Capacity: 20.9 mmBtu/hr
Control Equipment: None

(b) Process operations consisting of the following:

| Emission Point | Description | Installation Date | Maximum Capacity (ton nickel alloy processed per hour) |
|---|---|---|---|
| 01 | **Blending and Ball Milling Powder Metals:** Batch operation consisting of blending and ball milling of powder materials. Equipped with a baghouse for particulate control - control efficiency of 99.9%. | 1969 | 0.71 |
| 13 | **Billet Heating Furnace:** Continuous operation consisting of natural gas fired furnace heating billets.<br>Fuel: Natural gas<br>Rated Capacity: 38.0 mmBtu/hr<br>Control Equipment: None | 1970 | 17.5 |
| 14 | **Annealing Furnace:** Continuous operation consisting of metal annealing furnace.<br>Fuel: Natural gas<br>Rated Capacity: 18.0 mmBtu/hr<br>Control Equipment: None | 1972 | 2.65 |
| 18 | **Induction Melting:** Batch operation consisting of induction melting of the metal. Equipped with a baghouse for particulate control - control efficiency of 99.9%. | 1969 | 6.00 |
| 19 | **Ingot Pouring:** Batch operation consisting of pouring of melted metal into ingot. No emission control. | 1969 | 6.00 |
| 22 | **Striker Plate Cut-off, Plasma Torch:** Batch operation consisting of metal cutting using plasma torch. No emission controls. | 1973 | 6.00 |
| 23 | **Electroslag Remelt Furnace # 3 & #4:** Batch operation consisting of electroslag remelt furnace. Equipped with a baghouse for particulate control - control efficiency of 99.0% | 1982 | 1.00; and 0.63 tons flux/hr |
| 24 | **Electroslag Remelt Furnace # 5 & #6:** Batch operation consisting of electroslag remelt furnace. No emission controls. | 1985 | 1.00; and 0.63 tons flux/hr |

| Emission Point | Description | Installation Date | Maximum Capacity (ton nickel alloy processed per hour) |
|---|---|---|---|
| 25 | **Electroslag Remelt Furnace # 7 & #8:** Batch operation consisting of electroslag remelt furnace equipped with a baghouse for particulate control with control efficiency of 99.0% | 1992 | 1.00; and 0.63 tons flux/hr |
| 26 | **Electroslag Remelt Furnace # 9 & #10:** Batch operation consisting of electroslag remelt furnace equipped with a baghouse for particulate control with control efficiency of 99.0% | 1997 | 1.00; and 0.63 tons flux/hr |
| 27 | **Electroslag Remelt Furnace # 11:** Batch operation consisting of electroslag remelt furnace equipped with a baghouse for particulate control with control efficiency of 99.0% | 2006 | 0.50; and 0.315 tons flux/hr |

(c) Pickling operations consisting of the following:

| Emission Point | Description | Installation Date | Maximum Capacity (ton metal processed/ hr) |
|---|---|---|---|
| 07 | **Pickling Tank #3:** Batch operation consisting of one 15,000 gallon pickling tank containing $H_2SO_4$ with a maximum makeup rate of 10,000 gal/hr. Fume exhaust system for fugitive emissions capture; no emission controls. | 1969 | 14.00 |
| 08 | **Pickling Tank #5:** Batch operation consisting of one 15,000 gallon pickling tank containing $HNO_3$ and NaCl with a maximum makeup rate of 10,000 gal/hr. Fume exhaust system for fugitive emissions capture; no emission controls. | 1969 | 11.00 |
| 09 | **Pickling Tank #6:** Batch operation consisting of one 15,000 gallon pickling tank containing $H_2SO_4$ and NaCl with a maximum makeup rate of 10,000 gal/hr. Fume exhaust system for fugitive emissions capture; no emission controls. | 1969 | 11.00 |
| 10 | **Pickling Tank #7:** Batch operation consisting of one 15,000 gallon pickling tank containing HCl with a maximum makeup rate of 10,000 gal/hr. Fume exhaust system for fugitive emissions capture; no emission controls. | 1969 | 11.00 |
| 11 | **Rinse Water Tank #8:** Batch operation consisting of one 15,000 gallon rinse tank. No emission controls. | 1970 | 11.00 |

| Emission Point | Description | Installation Date | Maximum Capacity (ton metal processed/ hr) |
|---|---|---|---|
| 12 | **Pickling - Deglass Salt:** Batch operation consisting of one 15,000 gallon pickling tank containing Deglass Salt used for pickling and surface cleaning. The tank exhausts fugitively inside the building.<br>Fuel: Natural gas<br>Rated Capacity: 10.5 mmBtu/hr<br>Control Equipment: None | 1970 | 14.00 |

Source insignificant activities, as defined in 401 KAR 52:030, Section 6, are listed in Section C of the permit.

**COMMENTS:**

**Type of control and efficiency:**
The source uses baghouses to control particulate emissions from process operations including EP 01 (Blending & Ball Milling Powder Metals), EP 18 (Induction Melting), EP 23 (Electroslag Remelt Furnaces #3 and #4), EP 25 (Electroslag Remelt Furnaces #7 and #8), EP 26 (Electroslag Remelt Furnaces #9 and #10), and EP 27 (Electroslag Remelt Furnace # 11). The particulate control efficiency for the control equipment at EP 01 and 18 is assumed to be 99.9%, while for all other emission points the control efficiency is assumed to be 99.0%. The source uses a fume exhaust system to minimize fugitive emissions from the pickling tanks; however, there are no emission control systems on the pickling tanks.

**Emission factors and their source:**
AP-42, Chapter 1.4, Tables 1.4-1, -2 and -3 were used to determine the natural gas combustion emissions from the Pickling Boiler and process furnaces (Billet heating, annealing, and Deglass). Emissions factors for PM/PM10 from the electroslag remelt furnaces are based on stack tests conducted in 1980's, and the HAP metal factors are based on material balance using the weight percentages of alloy products as provided by the permittee. Other source emission factors, including PM/PM10 and HAP metals from the induction furnace, and pickling operation PM/PM10 fume, are provided by the permittee based on material balance and engineering judgment. Source emissions testing will be required as a condition of this permit to confirm specific emission factors.

Refer to the detailed emission calculations in the Pollutant of Concern (POC) tables.

**Applicable Regulations:**
a) Gas Boiler for Pickling (EP 15) is subject to 401 KAR 61:015, *Existing indirect heat exchangers,* which is applicable to existing indirect heat exchangers with a capacity of 250 mmBtu/hr or less and commencing before April 1972. The following allowable particulate, opacity and sulfur dioxide ($SO_2$) emission limits are included in the permit.

   i. Pursuant to 401 KAR 61:015, Section 4(1), particulate emission rate for the boiler is based on the following equation:

PM Emission rate (lb/mmBtu) = 0.9634 x (total heat input rating for the source)$^{-0.2356}$
PM Emission rate = 0.9634 x (60.7)$^{-0.2356}$
= 0.37 lb/mmBtu

ii. Pursuant to 401 KAR 61:015, Section 5(1), $SO_2$ emission rate for the boiler is based on the following equation:

SO2 Emission rate (lb/mmBtu) = 8.0189 x (total heat input rating for the source)-0.1260
SO2 Emission rate = 8.0189 x (60.7)-0.1260
= 4.78 lb/mmBtu

iii. Pursuant to 401 KAR 61:015, Section 4(2), opacity of visible emissions from Boiler (EP 15) shall not exceed twenty (20) percent.

*(Note: Operating Permit No. O-86-032 determined the above particulate and $SO_2$ emission rate limitations based on the total heat input of three boilers which existed at the time of permit issuance (combined heat input capacity for the three boilers was 60.7 mmBtu/hr). While two of the boilers (EP 06 and 04) have been removed from this source, the above calculated emission rates for remaining boiler EP 15 remain unchanged, as per 401 KAR 61:015, Section 3(2).)*

b) 401 KAR 61:020, Existing Process Operations
Pursuant to 401 KAR 61:020, Section 1, the requirements of this rule apply to each affected facility, associated with a process operation, which is not subject to another emission standard with respect to particulates in 401 KAR Chapter 59, commenced before July 2, 1975. The requirements of this rule are included in the permit for EP 01 (Blending & Ball Milling Powder Metals), EP 07 (Pickling Tank #3), EP 08 (Pickling Tank #5), EP 09 (Pickling Tank #6), EP 10 (Pickling Tank #7), EP 11 (Pickling Tank #8), EP 12 (Pickling - Deglass Salt), EP 13 (Billet Heating Furnace), EP 14 (Annealing Furnace), EP 18 (Induction Melting), EP 19 (Ingot Pouring), and EP 22 (Striker Plate Cut-off, Plasma Torch).

Pursuant to 401 KAR 61:020, Section 3(1)(a), no person shall cause, suffer, allow, or permit any continuous emission into the open air from a control device or stack associated with any affected facility which is equal to or greater than forty (40) percent opacity.

Mass Emission Limit pursuant to 401 KAR 61:020 Section 3(2)(a): For process rates greater than or equal to 1,000 lbs/hr but less than 60,000 lbs/hr, the allowable emissions of particulate matter shall not exceed : 4.10 × (Tons Processed)$^{0.67}$ lbs/hr. For processing rates of 1000 lbs/hr or less, the allowable emission rate is 2.58 lbs/hr. Following is the maximum allowable emission rate from each operation at the corresponding process rate:

EP 01: 3.259 lb/hr based on process rate of 0.71 ton/hr
EP 07: 24.02 lb/hr based on process rate of 14.0 ton/hr
EP 08: 20.44 lb/hr based on process rate of 11.0 ton/hr
EP 09: 20.44 lb/hr based on process rate of 11.0 ton/hr
EP 10: 20.44 lb/hr based on process rate of 11.0 ton/hr
EP 11: 20.44 lb/hr based on process rate of 11.0 ton/hr
EP 12: 20.44 lb/hr based on process rate of 11.0 ton/hr

EP 13: 27.90 lb/hr based on process rate of 17.5 ton/hr
EP 14: 7.876 lb/hr based on process rate of 2.65 ton/hr
EP 18: 13.62 lb/hr based on process rate of 6.0 ton/hr
EP 19: 13.62 lb/hr based on process rate of 6.0 ton/hr
EP 22: 13.62 lb/hr based on process rate of 6.0 ton/hr

c) 401 KAR 59:010, New Process Operations
Pursuant to 401 KAR 59:010, Section 1, the requirements of this rule apply to each affected facility, associated with a process operation, which is not subject to another emission standard with respect to particulates in 401 KAR Chapter 59, commenced on or after July 2, 1975. The requirements of this rule are included in the permit for EP 23 (Electroslag Remelt Furnace #3 and #4), EP 24 (Electroslag Remelt Furnace #5 and #6), EP 25 (Electroslag Remelt Furnace #7 and #8), EP 26 (Electroslag Remelt Furnace #9 and #10), and EP 27 (Electroslag Remelt Furnace # 11).

Pursuant to 401 KAR 59:010, Section 3(1)(a), no person shall cause, suffer, allow, or permit any continuous emission into the open air from a control device or stack associated with any affected facility which is equal to or greater than twenty (20) percent opacity.

Mass Emission Limit pursuant to 401 KAR 59:010 Section 3(2)(a): For process rates greater than or equal to 1,000 lbs/hr but less than 60,000 lbs/hr, the allowable emissions of particulate matter shall not exceed : $3.59 \times (\text{Tons Processed})^{0.62}$ lbs/hr. For processing rates of 1000 lbs/hr or less, the allowable emission rate is 2.34 lbs/hr. Following is the maximum allowable emission rate from each operation at the corresponding process rate:

EP 23: 4.86 lb/hr based process rate of 1.63 ton/hr
EP 24: 4.86 lb/hr based process rate of 1.63 ton/hr
EP 25: 4.86 lb/hr based process rate of 1.63 ton/hr
EP 26: 4.86 lb/hr based process rate of 1.63 ton/hr
EP 27: 2.34 lb/hr based process rate of 0.50 ton/hr

d) 401 KAR 63:020, *Potentially Hazardous Matter or Toxic Substances*, is applicable to an emissions unit which emits or may emit potentially hazardous matter or toxic substances, provided such emissions are not elsewhere subject to the provisions of the administrative regulations of the Division for Air Quality.

**Non-Applicable Regulations:**

a) 40 CFR 60, Subpart D, *Standards of Performance for Fossil-Fuel-Fired Steam Generators for Which Construction is Commenced After August 17, 1971* (incorporated by reference at 401 KAR 60:005) does not apply because the Gas Pickling Boiler (EP 15) is not rated above the rule applicability threshold of 250 mmBtu/hour.

b) 40 CFR 60, Subpart Db, *Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units that were Constructed after June 19, 1984* (incorporated by reference at 401 KAR 60:005) does not apply because the unit is not rated above the rule applicability threshold of 100 mmBtu/hour.

c) 40 CFR 60, Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units that were Constructed after June 9, 1989* (incorporated by reference at 401 KAR 60:005) does not apply because the Gas Pickling Boiler (EP 15) was constructed before the rule applicability date of June 9, 1989 and there are no approvals to modify or reconstruct this unit.

d) 40 CFR 63, Subpart CCC, *National Emission Standards for Hazardous Air Pollutants for Steel Pickling - HCl Process Facilities and Hydrochloric Acid Regeneration Plants* (incorporated by reference at 401 KAR 63:002) does not apply because the facility does not pickle carbon steel and there is no HCl regeneration plant at the facility.

e) 40 CFR 64, *Compliance Assurance Monitoring (CAM)*, does not apply to any emission unit because this source is being approved to operate under a Conditional Major permit and, pursuant to 40 CFR 64.2(a), the requirements of this rule are applicable only to a source required to obtain a Title V (Part 70 or 71) permit.

**EMISSION AND OPERATING CAPS DESCRIPTION:**

To preclude the applicability of 401 KAR 52:020, *Title V permits*, the total annual source-wide emissions shall not exceed the following limitations on a twelve (12) consecutive month basis:

a. Particulate matter ($PM/PM_{10}$) emissions: 90 tons per twelve (12) consecutive month basis;

b. Any single hazardous air pollutant (HAP): 9 tons per twelve (12) consecutive month basis; and

c. Combined hazardous air pollutant (HAPs): 22.5 tons per twelve (12) consecutive month basis.

The permittee shall continue to apply voluntary limits on material usage and use of particulate control devices (baghouse for EP 18, 23, 25, 26, and 27; fume control for EP 07, EP 08, EP 09, EP 10, EP 11, EP 12) in order to comply with the specified emission limits. Related enforceable monitoring, record keeping and reporting requirements are included in the permit. The potential to emit all other criteria pollutants will be less than 100 tons per year each. Since this source is one of the 28 listed source categories, compliance with these permit limits shall also preclude this source from being a major stationary source and the requirements of 401 KAR 51:017, *Prevention of Significant Deterioration of Air Quality* are not applicable to this source.

**PERIODIC MONITORING:**

The permittee shall provide reasonable assurance that the PM/PM10 and HAP (primarily as constituent HAP metals) emission limitations are met by monitoring amounts and types of process materials used and hours of operation each calendar month, along with computed pollutant emissions for the month. Furthermore, the permittee shall perform a qualitative visual observation of emissions from relevant emission unit stacks on a weekly basis and maintain a log of the observations, and determine the opacity of emissions by Reference Method 9 if visible emissions are observed.

Controls are exclusively for PM/$PM_{10}$, including HAP metals, that consist of baghouses. Monitoring of the control devices shall consist of system inspections in accordance with manufacturer recommendations.

**OPERATIONAL FLEXIBILITY:**

None.

**CREDIBLE EVIDENCE:**

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.